COMMENTARY

FROZEN POSSIBILITIES

On the Apparent Incompatibility of Quantum Mechanics and Relativity

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Surreal spiral of warped clocks in space, visualizing relativity and quantum uncertainty.alien.
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For decades, physicists have been trying to unify quantum mechanics and relativity theory – so far without success. Perhaps the problem does not lie in the formulas themselves, but in our perspective.

TWO WORLDS, TWO LANGUAGES

The general theory of relativity portrays the world as a smooth, continuous fabric of spacetime in which gravity is caused by the curvature of geometry. Quantum mechanics, on the other hand, operates in a reality of probabilities, superpositions, and discrete jumps. They are two theories that are experimentally unshakable in their respective domains – and yet incompatible as soon as one attempts to bring them together.

BECOMING AND BEING

Perhaps this incompatibility is less an indication of the incompleteness of physics than of a misunderstanding. For quantum mechanics and relativity theory do not address the same status of reality. Quantum mechanics describes becoming – the open, probabilistic initial state. Relativity theory, by contrast, captures being – the solidified form that emerges from this sea of possibilities.

GRAVITY AS A TRACE

In this picture, gravity would not be a fundamental force but the signature of the solidified, the imprint left by the transition from possibility to reality. Space and time appear like an ice floe on a restless quantum sea: stable enough to carry our lives, yet only a fragment of an infinite variety of potential crystallisation patterns. Gravity thus does not appear as a cause, but as the trace of the process through which the open becomes fixed form.

THE BIG BANG AS TRANSITION

In this light, the Big Bang acquires a new interpretation. It was not the absolute beginning out of nothing, but the tipping point at which the open quantum realm crystallised into a stable spacetime. The "firework" of expansion did not mark an origin, but rather the passage from becoming to being – from fluctuation to form. Gravity, in this picture, does not appear as the first force, but as the signature of the process itself: the imprint left by the conversion of the open into a fixed geometric structure. Thus, the Big Bang is less a creation event than a phase of transition, comparable to the moment when water freezes into ice – a shift that produces a new order without requiring the substance itself to arise from nothing.

BEFORE THE BEGINNING

This view also means that creation does not begin with the Big Bang. The Big Bang was not an absolute emergence out of nothing, but the moment when the open turned into form. It therefore points to a process beyond our spacetime. Yet because we ourselves are part of what has solidified, this "before" remains in principle inaccessible. No one can know what it was like, for concepts such as "before" or "beginning" belong to an order that only came into being with spacetime itself. Perhaps the greatest mystery of the universe lies not in the Big Bang, but in what preceded it.

MISCONCEPTION "PARALLEL UNIVERSES"

Even the popular notion of "parallel universes" can be understood in a more nuanced way. It is conceivable that, alongside our world, other solidifications of the quantum realm exist – fully fledged universes with their own spacetime. Equally conceivable are unfinished universes, mere embryonic solidifications that never developed into a stable reality. Yet whether complete or only inchoate, they remain inaccessible to us, as no connection to our world exists and life in our sense would hardly be possible there.

A NEW PERSPECTIVE

The price of this view is high: gravity loses its status as a fundamental interaction. Yet the gain is a surprisingly simple interpretation of the unresolved contradiction: quantum mechanics and relativity theory are not competitors, but temporally staggered stages of the same reality – process and result, beginning and end. Perhaps the solution lies not in the forced unification of two irreconcilable theories, but in the recognition of their relation to one another.

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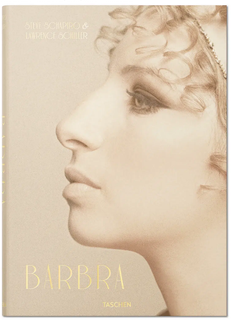

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